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EXAMINER	
PHAN, HUY Q	
ART UNIT	**PAPER NUMBER**
2687	

DATE MAILED: 12/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/070,410	AHNLUND ET AL.	
	Examiner	Art Unit	
	Huy Q. Phan	2687	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 November 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5 and 7-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5 and 7-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. This Office Action is in response to Amendment filed on date: 11/07/2005.

Claims 1-5 and 7-18 are still pending.

Response to Arguments

2. Applicant's arguments with respect to claims 1-5 and 7-18 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. **Claims 1-5, 7, 8, 11 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura et al. (US-6,269,087) in view of Chheda et al. (US-6,151,512).**

Regarding claim 1, Nakamura et al. disclose a method for operating a radio telecommunications system comprising a mobile station and two or more cell site units (col. 2, lines 3-26) each capable of communicating by radio with the mobile station on at least two communication channels ("downlink"; col. 5, line 61 and "uplink"; col. 6, lines 35); wherein the mobile station is in traffic communication on a traffic communication

channel with at least two of the cell site units ("different frequency soft handover"; see col. 2, line 49-col. 3, line 8); the method comprising:

the mobile station receiving signals for each of said two or more cell site units on each of the at least two communication channels ("different frequency soft handover"; see col. 2, line 49-col. 3, line 8; fig. 3 and its description);

the mobile station determining an estimate of the level of interference with signals on each of the at least two communication channels for each of said two or more cell site units (col. 5, line 59-col. 6, line 29).

the mobile station communicating to a handover controller the estimated of the level of interference with signals on each of the at least two communication channels for each of said two or more cell site units (col. 6, lines 15-63; for more details see cols. 5-7); and

the handover controller determining to which of the cell site units to hand over traffic communication of the mobile station on the basis of at least the estimated of the level of interference with signals on each of the at least two communication channels for each of the two or more cell site units ("different frequency soft handover"; see col. 2, line 49-col. 3, line 8 and cols. 5-7). But, Nakamura et al. do not particularly show wherein each cell units capable of communicating by radio with the mobile station on at least two communication channels having different frequencies. However in analogous art, Chheda et al. teach "A forward link between the base station and the mobile user and a reverse link between the mobile user and the base station use different frequency bands to operate" (see col. 9, lines 37-42). Since, Nakamura et al. (see abstract) and

Chheda et al. (see abstract) are related to the method of handoff in the wireless communication system; therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of Nakamura et al. as taught by Chheda et al. because "This frequency separation allows the mobile user and the base station to simultaneously operate without feedback or interference between transmitters and receivers" (see Chheda et al.'s specification col. 9, lines 37-42).

Regarding claim 2, Nakamura et al. and Chheda et al. disclose the method as claimed in claim 1. Nakamura et al. disclose the method comprising the step of transmitting to the mobile information specifying the at least two communication channels (col. 6, lines 51-63; for more details see cols. 5-7).

Regarding claim 3, Nakamura et al. and Chheda et al. disclose the method as claimed in claim 2. Nakamura et al. disclose the method wherein the said information specifies a frequency for each of the at least two communication channels ("different frequency soft handover" see col. 6, lines 51-63; for more details see cols. 5-7).

Regarding claim 4, Nakamura et al. and Chheda et al. disclose the method as claimed in claim 3. Nakamura et al. disclose the method wherein the said step of receiving comprises receiving signals on communication channels whose carrier frequencies are specified by the said information (col. 6, lines 15-63; for more details see cols. 5-7).

Regarding claim 5, Nakamura et al. and Chheda et al. disclose the method as claimed in claim 1. Nakamura et al. disclose the method comprising the step of the mobile station transmitting to a cell site unit information indicating the estimated levels of interference with signals on at least two of the communication channels (col. 6, lines 15-29; for more details see cols. 5-7).

Regarding claim 7, Nakamura et al. and Chheda et al. disclose the method as claimed in claim 1. Nakamura et al. disclose the method wherein the step of the handover control unit determining comprises determining to which communication channel of one of the cell site units to hand over traffic communication of the mobile station on the basis of at least that information indicating the estimated levels of interference (col. 2, line 49-col. 3, line 8).

Regarding claim 8, Nakamura et al. and Chheda et al. disclose the method as claimed in claim 7. Nakamura et al. disclose the method wherein the handover control unit determines to hand over to a channel having one of the lowest estimated levels of interference (col. 2, line 49-col. 3, line 8).

Regarding claim 11, Nakamura et al. disclose a mobile station for operation in a telecommunications system comprising at least two cell site units (col. 2, lines 3-14) wherein the mobile station is in traffic communication on a traffic communication

channel with at least two of the cell site units ("different frequency soft handover"; see col. 2, line 49-col. 3, line 8; fig. 3 and its description), each cell site unit being capable of communicating by radio with the mobile station on at least two communication channels ("different frequency soft handover"; see col. 2, line 49-col. 3, line 8; fig. 3 and its description); the mobile station comprising:

a receiver capable of receiving signals from a cell site units on a communication channel ("different frequency soft handover"; see col. 2, line 49-col. 3, line 8 and cols. 5-7);

an interference estimation unit for estimating the level of interference on a communication channel on which the receiver receives signals (col. 5, line 59-col. 6, line 29);

a channel analysis unit coupled to the receiver and the interference estimation unit for causing the receiver to receive signals from each of the cell site units on each of the respective communication channels in turn and receiving from the interference estimation unit an estimate of the level of interference on each of the at least two channels (col. 6, lines 15-63; for more details see cols. 5-7); and

a transmitter coupled to the channel analysis unit for transmitting to the mobile station communicating to a handover controller the estimated of the level of interference with signals on each of the at least two communication channels for each of the at least two cell site units ("different frequency soft handover"; see col. 2, line 49-col. 3, line 8 and cols. 5-7);

wherein the mobile device is arranged to perform a handover in dependence on the handover controller determining to which of the cell site units to hand over traffic communication of the mobile station on the basic of at least the estimated of the level of interference with signals on each of the at least two communication channels (col. 6, lines 15-63; for more details see cols. 5-7). But, Nakamura et al. do not particularly show wherein each cell units capable of communicating by radio with the mobile station on at least two communication channels having different frequencies.

However, Chheda et al. teach "A forward link between the base station and the mobile user and a reverse link between the mobile user and the base station use different frequency bands to operate" (see col. 9, lines 37-42); therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of Nakamura et al. as taught by Chheda et al. because "This frequency separation allows the mobile user and the base station to simultaneously operate without feedback or interference between transmitters and receivers" (see Chheda et al.'s specification col. 9, lines 37-42).

Regarding claim 15, Nakamura et al. and Chheda et al. disclose the mobile station as claimed in claim 11. Nakamura et al. disclose the mobile station wherein the channel analysis unit is capable of receiving via the receiver information specifying the said communication channels ("different frequency soft handover"; col. 5, line 59-col. 6, line 29; also see col. 2, line 49-col. 3, line 8; fig. 3 and its description).

5. Claims 9, 10 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura et al. in view of Chheda et al. and further in view of Trompower et al. (US-6,138,019).

Regarding claim 9, Nakamura et al. and Chheda et al. disclose the method as claimed in claim 1. But, Nakamura et al. and Chheda et al. fail to expressly teach wherein the mobile station stores an indication of a timing of the said signals on at least one of the communication channels and the mobile station interrupts another operation to receive the said signals at a time dependent on the stored indication of a timing. However in analogous art, Trompower et al. teach wherein the mobile station stores an indication of a timing of the said signals on at least one of the communication channels and the mobile station interrupts another operation to receive the said signals at a time dependent on the stored indication of a timing (col. 9, lines 22-42; also see cols. 9-10). Since, Nakamura et al., Chheda et al. and Trompower et al. ("(T)he present invention involves a cellular communication system hand-off protocol which helps minimize down time associated with a mobile device roaming among different cells in which different cells employ different communication channels (e.g., different frequency hopping sequences"; see Trompower et al. col. 4, lines 28-32) are related to the method for handover in the wireless communication system; therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system of Nakamura et al. and Chheda et al. as taught by Trompower et al. for purpose of increasing significantly the quality and reliability of the wireless communication services.

Regarding claim 10, Nakamura et al., Chheda et al. and Trompower et al. disclose the method as claimed in claim 9. Trompower et al. further disclose wherein the indication of a timing is an indication of the difference in timing between signals on the said communication channels ("delay"... "timing information"...; see cols. 9-10).

Regarding claim 16, Nakamura et al. disclose a method for operating a radio telecommunication system comprising a mobile station and two or more cell site units (col. 2, lines 3-14), wherein the mobile station is in traffic communication on a traffic communication channel with at least two of the cell site units ("different frequency soft handover"; see col. 2, line 49-col. 3, line 8); each cell site unit being capable of communicating by radio with the mobile station on at least two communication channels ("downlink"; col. 5, line 61 and "uplink"; col. 6, lines 35); the method comprising:

the mobile station receiving signals on one of the communication channels ("different frequency soft handover"; col. 5, line 59-col. 6, line 29; also see col. 2, line 49-col. 3, line 8 and cols. 5-7); and

the mobile station interrupting said receiving in order to receive signals on another of the communication channels ("hard handover"; see col. 2, line 49-col. 3, line 8);

the mobile station determining an estimated of the level of interference with signals received on each of the at least two communication channels for each of the two or more cell site units (col. 6, lines 15-63; for more details see cols. 5-7);

the mobile station communicating to a handover controller the estimated of the level of interference with signals with each of the at least two communication channels for each of the two or more cell site units (col. 6, lines 15-63; for more details see cols. 5-7);

the handover controller determining to which of the cell site units to hand over traffic communication of the mobile station on the basic of at least the estimated of the level of interference with signals on each of the at least two communication channels for each of the two or more cell site units ("different frequency soft handover"; see col. 2, line 49-col. 3, line 8 and cols. 5-7).

But, Nakamura et al. do not particularly show wherein each cell units capable of communicating by radio with the mobile station on at least two communication channels having different frequencies. However, Chheda et al. teach "A forward link between the base station and the mobile user and a reverse link between the mobile user and the base station use different frequency bands to operate" (see col. 9, lines 37-42); therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of Nakamura et al. as taught by Chheda et al. because "This frequency separation allows the mobile user and the base station to simultaneously operate without feedback or interference between transmitters and receivers" (see Chheda et al.'s specification col. 9, lines 37-42).

But, Nakamura et al. and Chheda et al. fail to expressly teach wherein the mobile station storing an indication of the timing difference between signals on the communication channels. However, Trompower et al. teach wherein the mobile station

storing an indication of the timing difference between signals on the communication channels ("delay"... "timing information"...; see cols. 9-10); therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system of Nakamura et al. and Chheda et al. as taught by Trompower et al. for purpose of increasing significantly the quality and reliability of the wireless communication services.

6. Claims 12-14, 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura et al. and Chheda et al. in view of Rozanski et al. (US-5,493,563).

Regarding claim 12, Nakamura et al. and Chheda et al. disclose the mobile station as claimed in claim 11. But, Nakamura et al. and Chheda et al. fail to expressly teach wherein the interference estimation unit is capable of estimating the level of interference by performing an error correction and/or signal recovery operation on received signals. However in analogous art, Rozanski et al. teach wherein the interference estimation unit is capable of estimating the level of interference (col. 4, lines 13-44) by performing an error correction and/or signal recovery operation on received signals (col. 3, lines 31-50). Since, Nakamura et al., Chheda et al. and Rozanski et al. are related to the method of handoff in the wireless communication system; therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system of Nakamura et al. and Chheda et al.

as taught by Rozanski et al. for purpose of increasing significantly the quality and reliability of the wireless communication services.

Regarding claim 13, Nakamura et al., Chheda et al. and Rozanski et al. disclose the mobile station as claimed in claim 12. Rozanski et al. further teach wherein the said operation is performed on a training sequence of the received signals (col. 2, lines 15-38).

Regarding claims 14 and 17, Nakamura et al., Chheda et al. and Rozanski et al. disclose the mobile station as claimed in claims 12 and 13, respectively. Rozanski et al. further teach wherein the interference estimation unit comprises a Viterbi equalizer (col. 3, line 57-col. 4, line 11).

Regarding claim 18, Nakamura et al., Chheda et al. and Rozanski et al. disclose the mobile station as claimed in claim 14. Nakamura et al. further disclose wherein the channel analysis unit is capable of receiving via the receiver information specifying the said communication channels ("different frequency soft handover"; see col. 2, line 49-col. 3, line 8; fig. 3 and its description).

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a) Silventoinen et al. (US-2002/0024939) disclose "the frequencies employed for the uplink transmission 233 and the downlink transmission 234 do not remain constant, in order to mitigate the effects of radio interference and attenuation etc. Thus, a burst of information may be lost, due to it being transmitted via a frequency having particularly poor transmission characteristics within the area concerned but the next burst will be received given that this burst will be transmitted on a different frequency" (see specification).

b) Antonio et al. (US-6,603,745) disclose "In a typical wireless system, the forward link and reverse link operate on different frequencies. Nevertheless, because the forward and reverse links operate within the same frequency band, a significant correlation exists between the average path loss of the two links" (see specification).

c) Soliman (US-6,542,743) discloses in fig. 2b "MSC 222 routes calls between the base stations 228 and 232. The source base station 228 directs calls to the first mobile 236 within the first cell 230 via a first communications path 238. The first communications path 238 is a two-way link having a forward link 240 and a reverse link 242. Typically, when the base station 228 has established communications with the mobile 236, the forward link 240 includes a traffic channel" (see specification).

d) Yano et al. (US-6,711,149) disclose a handover method (see abstract).

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Huy Q Phan whose telephone number is 571-272-7924. The examiner can normally be reached on 8AM-6PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kincaid G Lester can be reached on 571-272-7922. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Huy Phan

SONNY TRINH
PRIMARY EXAMINER

Examiner: Phan, Huy Q. AU: 2687 Date: 12/05/2005